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ABSTRACT

The psychological (expectancy) and physiological (dosage) effects of alcohol on aggressive and assertive behavior were investigated. The expectancy manipulation was accomplished by informing subjects that the beer they were to receive was either half as strong or twice as strong as commercially available beer. The dosage manipulation involved administering "blind" subjects either 0.0 (placebo), 0.5, or 1.0 ml of 95% pure ethanol per kilogram body weight. Male, social drinkers (N=54) were administered self-report and behavioral measures of aggressiveness and assertiveness following alcohol consumption. Analysis of the results indicated that both psychological and physiological effects of alcohol influenced aggression. A moderate dosage of alcohol increased self-report aggression scores, whereas a high dosage of alcohol increased scores on a behavioral measure of aggression. Additionally, subjects expecting a beer twice as strong as commercially available beer yielded higher aggressiveness scores than subjects expecting beer half as potent. Neither dosage expectancy nor actual dosage was found to influence assertiveness. (Author)

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The Effects of Alcohol Dosage and Dosage Expectancy on Aggressiveness and Assertiveness

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The Effects of Alcohol Dosage and Dosage Expectancy on Aggressiveness and Assertiveness

For many years alcohol researchers have investigated the relationship between alcohol consumption and human aggression. Much of this research was stimulated by early correlational studies (Shupe, 1954; Wolfgang & Strohm, 1956), which suggested that there was a significant relationship between alcohol intoxication and crime. Later experimental research has yielded conflicting results. Some researchers have failed to find any relationship between alcohol consumption and aggressive behavior (Bennett, Buss, & Carpenter, 1969; Doleys, Otto, Osborne, Harris, & Snyder, 1967). Other researchers have found that alcohol increases aggression, but have disagreed as to whether the effects are due to physiological factors (actual dosage) or to psychological factors (expectancy).

Correlational researchers have suggested that there is frequently a "genuine causal relationship" between alcohol consumption and violent crime (Wolfgang & Strohm, 1956). Wolfgang and Strohm collected data from the files of the Homicide Squad of the Philadelphia Police Department for 588 homicide cases for a four year period. The authors determined that alcohol was a contributing factor in 64% of the cases examined. Wolfgang and Strohm also found that alcohol was related to the method in which death was inflicted. The presence of alcohol was detected in 72% of stabbing, 69% of beating, and 55% of shooting homicides.

Such effects may not, however, be due to alcohol per se. Cross-cultural and anthropological research (McAndrew & Edgerton, 1969) suggests that increased aggression following alcohol consumption may be a function

of social factors rather than physiological effects of alcohol. McAndrew and Edgerton found evidence that violent drunken comportment, which is common in Western cultures, is extremely rare in many non-Western cultures. In fact, they found several Indian cultures in which persons became more docile following alcohol consumption. The authors did find definite behavioral differences between sober and drunken states, but suggest that members of a society adhere to socially sanctioned cultural limits even in a drunken state. Society, rather than the psychopharmacological effects of alcohol, is seen as controlling the individual's behavior following alcoholic intake.

McAndrew and Edgerton further suggest that drunken comportment may be seen as a "time-out"; a socially pre-arranged period of time in which the individual's behavior is permitted to differ from the norm. Sobell and Sobell (1973) also stress this fact: "Alcohol intoxication is socially accepted as an excuse for engaging in certain otherwise inappropriate behaviors, such as extremes of flirtation, extremes of aggression, or homosexuality, which are generally considered socially unacceptable when engaged in by a sober individual, but are tolerated from a person who is drunk" (p. 51). In essence, alcohol may be viewed as an "informative cue" which signifies that violent or uninhibited behavior is permissable.

Recent experimental research with human subjects aimed at delineating the factors responsible for alcohol's influence on aggression has yielded conflicting results. A study by Doleys, Otto, Osborne, Harris, and Snyder (1967) using female subjects, failed to find significant increases in self-reported aggression as a result of alcohol consumption. Bennett, Buss, and Carpenter (1969), using male subjects, sought to determine the effects of

alcohol dosage on aggression using a behavioral measure, the Buss aggression machine. The dependent measure was the mean shock level subjects delivered to a confederate who was attempting to learn a bogus discrimination task. Alcohol dosage did not influence the subjects' responses.

Shuntich and Taylor (1972) used a modified version of the Buss machine in a different context and found much different results. They used a task in which subjects competed with a confederate on a bogus discrimination task. Because competition was involved, and because subjects received as well as administered shocks, the authors described the experimental task as analogous to "conditions of provocation." Results indicated that subjects receiving alcohol showed higher levels of aggression than either control or placebo subjects. The placebo was intended as a control for dosage expectancy effects, and because the level of aggressiveness of subjects in the placebo group was less than that in the actual dosage group, Shuntich and Taylor concluded that the physiological effects of alcohol were primarily responsible for increased aggression under conditions of "provocation." Unfortunately, the experimenters found that their placebo manipulation was ineffective. Subjects' estimates of the amount of alcohol consumed were significantly lower for the placebo group in comparison to the actual dosage group. As such it becomes difficult to conclude that elevated aggression was solely a function of physiological factors. A later experiment by Taylor and Gammon (1974) yielded similar results. Although a placebo manipulation was not employed, it was found that subjects who received high dosages of alcohol were significantly more aggressive on a competitive task than controls. Again, the experimenters concluded that alcohol consumption results in increased aggression.

Lang, Goecker, Adesso, and Marlatt (1975) also used a Buss-type aggression machine, and attempted to discriminate between psychological (expectancy) and physiological effects of alcohol by employing a placebo manipulation. The experimenters found evidence indicating that dosage expectancy (psychological effects) rather than actual dosage (physiological effects) were responsible for the increase in aggression that was found. Those subjects who believed that they had consumed alcohol delivered shocks of significantly greater intensity and duration than those who believed that they had not, regardless of the actual beverage alcohol content.

Lang et al. made several suggestions in an attempt to explain results in direct contrast to those obtained by other researchers (e.g., Shuntich & Taylor, 1972), namely, that psychological factors (expectancy), rather than physiological effects are responsible for increased aggression following alcohol consumption. Lang et al. state that other investigators have used social drinkers, while their sample consisted of heavy drinkers. Heavy drinkers may differ not only in their expectations regarding alcohol's effects, but also in their physiological reaction to alcohol. Furthermore, other experimenters (e.g., Shuntich & Taylor, 1972) failed to demonstrate that subjects in placebo groups believed that they had consumed as much alcohol as subjects who actually did receive alcohol. In addition to suggestions made by Lang et al. it also seems important to note that their subjects consumed a higher dosage of alcohol than had been utilized in previous studies. Because alcohol may have much different effects at higher dosages, it is possible that smaller dosages would have produced results more compatible with those obtained in earlier research.

In summary, the exact nature of the relationship between alcohol consumption and aggression remains unclear. Cross-cultural and anthropological evidence in addition to some experimental research findings suggest that alcohol's effects are due to social or "expectancy" variables. Further support stems from experimental studies in which physiological (dosage) factors failed to influence aggressiveness. However, some researchers have found evidence that physiological factors do increase aggressiveness. At present, it remains unclear as to what extent physiological and psychological factors influence aggressive drunken comportment.

The present study is an attempt to clarify the contribution of psychological (expectancy) and physiological (dosage) factors in the determination of aggressive behavior in social drinkers following alcohol consumption. Two experimental manipulations were employed. A dosage expectancy manipulation was accomplished by informing subjects that beer which they were to drink was either half as strong or twice as strong as commercially available beer. The dosage manipulation involved administering to blind subjects either 0.0 (placebo), 0.5, or 1.0 ml of ethanol per kilogram body weight. In view of the results reported by alcohol/aggression researchers, the following hypotheses were chosen: (a) Higher dosages of alcohol will result in increased aggressiveness and assertiveness: (b) Subjects given a higher dosage expectancy will behave more aggressively and assertively than subjects given the low dosage expectancy. Assertiveness measures were included because some researchers have suggested that both assertiveness and aggressiveness require a lack of inhibition (Alberti & Emmons, 1970). Thus, it was hypothesized that alcohol would influence assertiveness as well.

Method

Design

This experiment employed a 3 x 2 random groups factorial design. The independent variables were alcohol dosage and dosage expectancy. The dependent measures included behavioral and self-report measures of aggression and assertiveness. As mentioned earlier, because assertiveness and aggressiveness imply a lack of inhibition it was expected that both would increase as a function of dosage and expectancy.

Subjects

Fifty-four male subjects were selected from introductory psychology courses at Appalachian State University. Potential subjects were administered an alcohol questionnaire which assessed how frequently subjects drank on weekends and weekdays, and how frequently subjects drank alone. Total scores on the questionnaire could range from zero (never) to twelve (always). Subjects scoring above five or below two were rejected in order to obtain a subject population consisting primarily of social drinkers. Two potential subjects were eliminated: one whose score was one, another whose score exceded five. The remaining subjects were randomly assigned to each of the six experimental groups.

Each participant was required to read and sign an informed consent form. Subjects were told that following consumption of a dosage of alcohol based on their weight, they would be asked to complete a number of questionnaires designed to measure aspects of mental functioning such as hand-eye coordination, decision making, and reasoning ability. In order to ensure their safety, all subjects were informed that they would be required to remain in the experimental area until the experimenter had decided that their

level of intoxication had decreased sufficiently. It was also stressed that, excluding the mandatory detoxification period, subjects were free to discontinue their participation in the study at any time.

Alcohol Dosage

The placebo consisted of Metbrew Near Beer(c), a nonalcoholic beer. Those subjects assigned to groups receiving alcohol were given Metbrew to which the appropriate dosage of 95% pure ethanol had been added. Those subjects assigned to the placebo group received Metbrew to which no ethanol had been added. Alcohol dosages were based upon body weight, and all subjects consumed approximately 24 oz of beer. The particular dosages selected were commensurate with those commonly used by alcohol/aggression researchers (Bennett, Buss, & Carpenter, 1969; Shuntich & Taylor, 1972).

Dependent Measures

A number of assertiveness and aggressiveness measures were used in the present study.

Aggression

Four subscales of the Buss-Durkee Hostility Inventory (1957) were used as self-report measures of aggression. Subjects were asked to reply True or False to a series of statements which might describe them. Four dependent measures based on individual totals for the Assault, Negativism, Verbal Hostility, and Indirect Hostility subscales were obtained. In addition, the total score for the four subscales was also used as a dependent measure. Research has indicated that the five Buss-Durkee measures in the present study serve as valid indices of aggressiveness (Renson, Adams, & Tinkenberg, 1978; Leibowitz, 1968).

A behavioral measure of verbal aggression was tabulated by recording the total occurrences of profanity for each subject during administration of the Bheavioral Assertiveness Test (BAT) developed by Eisler, Miller, and Hersen (1973). An audiotaped series of ten different hypothetical situations is presented to each subject. A narrator gives a brief description of the situation which is followed by a remark made by a role model calling for a response from the subject. The subject is then asked to respond to the model as if the situation were really occurring.

Assertiveness

The BAT was used as a measure of assertiveness as well as aggressiveness. Five different measures of assertiveness were recorded for each of the ten situations; response latency, affect, loudness, compliance (compliance content), and requests for new behavior (content requesting new behavior). The five dependent measures were tabulated individually by obtaining the subjects' total score for the ten situations. Reliability was established for the five assertiveness measures as well as the behavioral aggressiveness measure (occurrences of profanity) using two judges. Eighty-five percent was set as the minimum level of inter-rater reliability.

Subjects were also administered the self-report Assertiveness Scale designed by Rathus (1973). This measure involves the subject responding to 30 statements describing nonassertive and assertive behaviors. The subject responds to each item using a scale which indicates the degree to which the behavior is characteristic of himself. The dependent measure is the total score of all items.

Cognitive Measures

Two additional measures were added in order to reduce the reactivity

of aggressiveness/assertiveness measures and ensure that later subjects would be naive. Subjects were instructed by the informed consent that the study was primarily concerned with decision making, hand-eye coordination, and reasoning ability. To reinforce this belief, subjects were administered the Digit Symbol subtest of the Wechsler Adult Intelligence Scale (WAIS) and the Shipley Institute of Living Scale, a measure of general intellectual ability.

Procedure

Following completion of the alcohol questionnaire subjects were scheduled for a testing session. Upon arrival, subjects were sequentially assigned, in blocks of six, to one of the six treatment conditions. After signing the consent form, subjects were informed that they were to receive approximately 24 oz of beer which was either one half as strong (low dosage expectancy) or twice as strong (high dosage expectancy) as commercially availabe beer. Subjects were than weighed in order to determine the exact amount of ethanol to be added to their beer.

Subjects were brought a pitcher containing the beer mixture, advised that they would have 20 min to finish the beer, and told to pace themselves at about 8 oz of beer per five minute period. Following beer consumption, subjects were told to wait 20 min for the beer to take effect. The experimenter then returned to the experimental room to administer the tests.

In a counterbalanced sequence, subjects were administered the Buss-Durkee Hostility Inventory, the Rathus Assertiveness Scale, and the BAT. The experimenter was present only during the BAT. His function in this case was to operate the playback and record tape recorders, and to answer

any questions the subject might have. For the two remaining tests, subjects were given test materials and instructions were presented via a casette recorder.

Subjects were then administered the Digit Symbol subtest of the WAIS and the Shipley Institute of Living Scale in a counterbalanced sequence. Instructions for these two tests were also given via a casette recording.

Each subject was debriefed following the experimental procedure. They were questioned concerning their perception of the amount of alcohol consumed, the purpose of the experiment, and the expected experimental results. Following this, the experimenter assessed the subjects' level of intoxication. Subjects in the high dosage condition and subjects expressing discomfort were asked to remain in the experimental area until their level of intoxication had decreased to a safe level. Before departing, subjects were asked not to discuss the experiment with anyone. The importance of this was explained, subjects were given their experimental credit, and thanked for their cooperation.

Results

Aggression

The first series of dependent measures investigated were those pertaining to aggression. These measures included the four subscale scores of the Buss-Durkee Hostility Inventory (BD), the BD Total score, and the total number of occurrences of profanity obtained from the Behavioral Assertiveness Test (BAT). A 2 x 3 analysis of variance was performed on each of these six aggression measures. Each analysis compared dosage expectancy (high vs. low) and actual dosage (0.0, 0.5, 1.0ml. ethanol/kg. body weight).

Analysis of variance results for the BD Verbal Hostility score (see Table 1) revealed that the low versus high dosage expectancy factor was significant ($F(1, 53) = 8.5$, $p < .01$). Subjects in the high dosage expectancy group scored significantly higher on the Verbal Hostility subscale than the low dosage expectancy group. The mean scores for the high and low expectancy group were 9.6 and 7.8 respectively. Analysis of variance results also indicated that the actual dosage factor was significant ($F(2, 52) = 3.4$, $p < .05$). The means for the placebo, moderate, and high dosage groups were 7.6, 9.6, and 8.9 respectively (see Table 2 for means and standard deviations). A t-test comparison of means (Bruning & Kintz, 1968) indicated that the moderate dosage group had significantly higher Verbal Hostility scores than the placebo group ($t = 2.22$, $df = 34$, $p < .05$). This suggested that a moderate dosage of alcohol may increase verbal hostility. No significant differences were found between any of the other actual dosage groups. The two-way interaction between actual dosage and dosage expectancy was not significant.

Analysis of variance data for the BD Total score (see Table 3) revealed that the low versus high dosage expectancy factor was significant ($F(1, 53) = 7.0$, $p < .05$). Subjects in the high dosage expectancy group scored significantly higher on Total Hostility than the low dosage expectancy group. The means for the high and low dosage expectancy groups were 23.7 and 20.0 respectively. Analysis of variance data indicated that the actual dosage factor was also significant ($F(2, 53) = 4.0$, $p < .05$). Means for

Table 1

Means and Standard Deviations for Buss-Durkee Total Scores*

Dosage Expectancy	0.0ml/kg	0.5ml/kg	1.0ml/kg
Low Dosage Expectancy	17.2(5.6)	23.0(4.3)	19.6(5.2)
High Dosage Expectancy	22.0(6.3)	26.1(6.1)	23.1(3.8)

*Higher scores indicate higher levels of aggression. Standard deviations are presented in parentheses.

Table 2

Means and Standard Deviations for Profanity Scores*

Dosage Expectancy	0.0ml/kg	0.5ml/kg	1.0ml/kg
Low Dosage Expectancy	0.2(0.4)	0.3(0.7)	0.7(1.1)
High Dosage Expectancy	0.1(0.3)	0.3(0.7)	1.6(2.2)

*Scores are mean number of occurrences of profanity in the 10 situations of the Behavioral Assertiveness Test. Standard deviations are presented in parentheses.

Table 3

ANOVA Summary Table for Buss-Durkee Total Scores

Source	df	Mean Square	F
Expectancy	1	196.463	7.008*
Dosage	2	113.389	4.045*
Expectancy x Dosage	2	3.352	0.120
Within Subjects	48	28.032	
Total	53	33.500	

*$p < .05$

the placebo, moderate, and high dosage groups were 19.6, 24.6, and 21.3 respectively (means and standard deviations for Total Hostility are presented in Table 4). A comparison of means using a t-test indicated that the moderate (actual) dosage group scored higher on Total Hostility than the placebo group ($t = 2.54$, $df = 34$, $p < .05$). No other significant differences were found between any of the other actual dosage groups. The two-way interaction between actual dosage and dosage expectancy was not significant.

Results obtained for the analysis of variance on the BAT occurrences of profanity measures (see Table 5) revealed that the low versus high dosage expectancy factor was not significant. However, the data revealed that the actual dosage factor was significant ($F(2, 53) = 3.6$, $p < .05$). Means for the placebo, moderate, and high dosage groups were 0.2, 0.3, and 1.1 respectively (see Table 6). Inter-rater reliability for occurrences of profanity was 100%. A t-test comparison of means indicated that the high (actual) dosage group used significantly more profanity than either the placebo ($t = 2.40$, $df = 34$, $p < .05$) or moderate dosage groups ($t = 2.33$, $df = 34$, $p < .05$). This suggested that only a high dosage of alcohol would serve to elevate the use of profanity. The two-way interaction between main effects was not significant.

Analyses of variance were also performed on the Assault, Negativism, and Indirect Hostility subscales of the BD. In none of these analyses were the main effects of interactions found to be significant.

Table 4

ANOVA Summary Table for Profanity Scores

Source	df	Mean Square	F
Expectancy	1	0.907	0.178
Dosage	2	4.474	3.619*
Expectancy x Dosage	2	1.352	1.070
Within Subjects	48	1.264	
Total	53	1.385	

*$p < .05$

Table 5

Means and Standard Deviations for Perceived Dosage*

Dosage Expectancy	0.0ml/kg	0.5ml/kg	1.0ml/kg
Low Dosage Expectancy	1.4(1.1)	1.5(0.7)	2.7(1.1)
High Dosage Expectancy	3.3(1.4)	3.9(3.3)	4.7(1.1)

*Standard deviations are presented in parentheses.

Table 6

ANOVA Summary Table for Perceived Dosage

Source	df	Mean Square	F
Expectancy	1	5953.496	56.584***
Dosage	2	818.575	7.780**
Expectancy x Dosage	2	24.501	0.233
Within Subjects	48	105.216	
Total	53	239.434	

**$p < .01$

***$p < .001$

Assertiveness

The second series of dependent measures investigated were those pertaining to assertiveness. These measures included the Rathus Assertiveness Scale as well as the five BAT measures; response latency, loudness, compliance content, content requesting new behavior, and affect. A separate 2 x 3 analysis of variance was conducted for each of the six assertiveness measures comparing dosage expectancy and actual dosage. No significant main effects or interactions were detected for any of the six dependent measures.

Inter-rater reliabilities for the BAT measures; response latency, loudness, compliance content, content requesting new behavior, and affect were 90%, 98%, 93%, 99% and 99% respectively.

Comparison Between Assertiveness and Aggressiveness Measures

In order to test the earlier assumption that a relationship exists between assertiveness and agressiveness, Pearson Product-Moment correlations were obtained between all twelve dependent measures (see Table 7). The Rathus Assertiveness Scale was significantly correlated with the BD Verbal Hostility score ($r = .23$, $p < .05$). None of the other four Buss-Durkee subscales were significantly correlated with the Rathus Score. Of the six BAT measures only occurrences of profanity (an aggressiveness measure) was significantly correlated ($r = .22$, $p < .05$) with any of the BD Hostility scores. The Total Hostility score correlated significantly ($r = .22$, $p < .05$) with occurrences of profanity.

Table 7

Correlation Coefficients for Assertiveness and Aggressiveness Measures

		R	RL	CL	CC	CRNB	A	P	AS	I	N	V	T
BEHAVIORAL ASSERTIVE	Rathus (R)	--	.01	.32**	.05	.23**	.32**	.37***	.07	-.01	-.04	.23**	.07
	Resp. Lat. (RL)		--	-.34**	-.17	.00	-.32**	.10	.03	.02	-.01	-.14	-.07
	Loudness (L)			--	.20	.28	.82***	.36**	.04	-.04	-.14	.16	.05
	Comp. Cont. (CC)				--	.45***	.23*	.04	.02	.05	.05	.08	.09
	Cont. R. N. Beh. (CRNB)					--	.23*	.14	-.06	.02	.07	.22	.09
	Affect (A)						--	.39***	.05	.17	-.17	.13	.09
	Profanity (P)							--	.11	.17**	.15	.19	.22*
BUSS-DURKEE	Assault (AS)								--	.40***	.30*	.42***	.80***
	Indirect (I)									--	.21	.40**	.69***
	Negativism (N)										--	.17	.47***
	Verbal (V)											--	.78***
	Total (T)												--

*$p < .05$

**$p < .01$

***$p < .001$

Debriefing

Following the experimental session subjects were asked to estimate the amount of alcohol, in ounces, they had consumed. This measure was used as an indication of the placebo's effectiveness. Additionally, it allowed for evaluation of effects of the two factors, actual dosage and dosage expectancy, in the process of determining beverage alcohol content (see Table 8 for means and standard deviations of all treatment groups).

Results of the 2 x 3 analysis of variance (actual dosage vs. dosage expectancy) performed with estimated ounces of alcohol received as the dependent measure (see Table 9) indicated that the high versus low dosage expectancy factor was significant ($F(1,53) = 56.6$, $p < .001$). Those subjects who were told they would receive a doubly potent beer apparently believed they had consumed more alcohol than those subjects expecting a beer one-half as strong as commercially available beer. The mean estimates for the low and high dosage expectancy groups were 1.9 and 4.0 respectively, suggesting the dosage expectancy manipulation was effective. Analysis of variance data also revealed that the actual dosage factor was significant ($F(2,53) = 7.8$, $p < .01$). The means for the placebo, moderate, and high dosage conditions were 2.4, 2.7, and 3.7 respectively. A t-test comparison of means indicated that the high dosage group perceived that they had consumed significantly more alcohol than either the placebo ($t = 2.40$, $df = 16$, $p < .05$) or the moderate dosage groups ($t = 2.33$, $df = 16$, $p < .05$).

Table 8

Means and Standard Deviations for Perceived Dosage

Dosage Expectancy	0.0ml/kg	0.5ml/kg	1.0ml/kg
Low Dosage Expectancy	1.4(1.1)	1.5(0.7)	2.7(1.1)
High Dosage Expectancy	3.3(1.4)	3.9(3.3)	4.7(1.1)

*Standard deviations are presented in parentheses.

Table 9

ANOVA Summary Table for Perceived Dosage

Source	Df	Mean Square	F
Expectancy	1	5953.495	56.584***
Dosage	2	818.575	7.780**
Expectancy x Dosage	2	24.501	0.233
Within Subjects	48	105.216	
Total	53	239.434	

**$p < .01$

***$p < .001$

Most important, there was no significant difference obtained for perceived alcohol content between the placebo and moderate dosage groups. This suggests that regardless of the alcohol content, subjects in the placebo (no alcohol) group believed they had consumed as much alcohol as the moderate dosage group. The two-way interaction between alcohol dosage and dosage expectancy was not significant.

In addition to being questioned about beverage alcohol content, all subjects were asked to indicate what they thought were the purpose and expected result of the experiment. Through these questions in effort was made to determine how much each subject knew about the experiment beforehand and how much he had learned through participation. Responses to these questions revealed that no subject had been given additional information from earlier participants. Most important, no subject seemed aware that assertiveness or aggressiveness was being measures.

Discussion

The results of this study suggest that two factors are involved in the determination of aggressive behavior following alcohol consumption. The first of these factors is alcohol dosage. Apparently, a moderate dosage of alcohol tends to increase some forms of self-reported aggression. Significant increases were found for both Verbal and Total Hostility measures. Total Hostility is a measure based upon sums of the four Buss-Durkee subscales; Assaultiveness, Indirect Hostility, Negativism, and Verbal Hostility. Each of these subscales is intended to assess a different form of aggressiveness. However, because significant differences were obtained for only the Verbal Hostility subscale, significant differences

between groups on the Total Hostility score may solely reflect differences in verbal aggressiveness. High dosages of alcohol seem to inhibit or suppress aggression. This is suggested by the finding of no significant differences in self-reported aggression between placebo (no alcohol) and high dosage groups. It is well known that alcohol acts as a depressant. Perhaps at higher dosage levels this property of alcohol is responsible for the lack of increased aggression.

A high, rather than moderate, dosage of alcohol was found to increase occurrences of profanity, a behavioral measure of verbal aggression. The behavioral measure was affected differently by dosage than were the self-report measures of aggression. This finding may reflect the fact that self-report measures rely primarily on cognitive functioning, which may be more prone to alcohol's depressant effects than behavioral measures. It is possible that the behavioral responses were more reflexive in nature, and less dependent on cognitive functioning.

The second factor found to affect aggressive behavior was alcohol dosage expectancy. Those subjects who expected that they were to receive high dosages of alcohol, regardless of the actual amount they received, exhibited significantly more self-reported aggression than those subjects expecting low dosages of alcohol. This suggests that individuals have different expectancies regarding the effects of low and high dosages of alcohol on aggression. Apparently, these expectations alone are sufficient to affect the amount of aggression following alcohol consumption.

The results of the present study indicate differential effects of alcohol on assertiveness and aggressiveness. Dosage and expectancy factors

were found to influence aggressiveness, but not assertiveness. Correlational analyses conducted to help clarify the relationship between aggressiveness and assertiveness indicated that these two constructs were essentially unrelated.

These results lend support to findings made by previous alcohol researchers. Shuntich and Taylor (1972) and Taylor and Gammon (1974) found that dosage of alcohol significantly affected a behavioral measure of aggression. Of the two studies, only the former sought to discriminate between expectancy (psychological) and physiological effects using a placebo. Although Shuntich and Taylor found no psychological effect, perhaps because their placebo was ineffective, the results of the present study indicated that expectancy effects can occur if placebo manipulations are effective.

Lang, Goecker, Adesso, and Marlatt (1975) found that expectancy, and not physiological (dosage) effects of alcohol contributed to aggression. There are a number of differences between the Lang et al. study and the present study which may account for the differences in finding dosage effects. Lang et al. used a subject sample consisting of heavy drinkers rather than social drinkers. Heavy drinkers may be expected to differ from social drinkers both in drinking patterns and in reaction to alcohol's physiological effects. In addition, Lang et al. used a dosage of alcohol which was 30% higher than the highest dosage used in the present study. High dosages produced changes in only one aggressiveness measure in this study. The phenomena may be curvilinear in that Lang et al.'s failure to find a physiological effect may be related to measuring aggressive be-

havior at the extremes of a dosage continuum. Perhaps if these experimenters had used several dosages in a lower range they might have found results comparable to the present study. In fact, the dosage used by Lang et al. is one of the highest dosages of alcohol used in any alcohol/aggression study to date.

The findings of this study indicate that alcohol consumption can result in increased verbal aggression. While previous research has suggested that the increase is primarily due to physiological factors, the present study suggests that psychological factors are involved as well. The fact that persons will become more aggressive simply as a result of a belief that they are consuming a potent alcoholic beverage, regardless of its actual content, clearly demonstrates that expectancy factors influence drunken comportment. Cross-cultural and anthropological research has indicated that these expectancies may evolve as a result of a social learning process. As such, it appears that violent drunken comportment may more accurately reflect a socially appropriate role in American society. The implications are that individuals have far more control over their drunken behavior than they are usually willing to admit. Perhaps we should not look differently at those who behave in a verbally aggressive manner following alcohol consumption and who attempt to attribute responsibility for their behavior to the alcohol alone.

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